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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,856	03/18/2004	Yoshihiro Ishibe	03500.017990	7722
5514	7590	05/19/2006	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO			PHAM, HAI CHI	
30 ROCKEFELLER PLAZA			ART UNIT	
NEW YORK, NY 10112			PAPER NUMBER	
			2861	

DATE MAILED: 05/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/802,856

Applicant(s)

ISHIBE, YOSHIHIRO

Examiner

Hai C. Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4 is/are allowed.
- 6) ☒ Claim(s) 1, 3 and 5-10 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>04/21/04</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3, 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishibe (U.S. 6,256,132) in view of Kato (EP 1122579).

Ishibe, an acknowledged prior art, discloses a multi-beam scanning optical system comprising light source means which has plural luminescence parts arranged apart from each other in both a main-scanning direction and a sub-scanning direction (light source 1 includes two light emissions sections A and B spaced apart in both main and sub-scanning directions) (Figs. 6A, 6B) (col. 5, lines 23-32), a rotating polygon mirror (5) which has reflection surfaces (5a) for deflecting plural light beams emitted from the plural luminescence parts, respectively, a first optical system (condensing lens 2) which is arranged in an optical path leading from the light source means to the rotating polygon mirror and converts the plural light beams into convergent light beams

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or divergent light beams (col. 5, lines 33-36), and a third optical system (f θ lens system 6) which guides the plural light beams deflected by the rotating polygon mirror onto a surface to be scanned of a drum shape (photosensitive drum 7) having a rotation axis along the main-scanning direction, wherein, in a sub-scanning section, the respective light beams to be made incident on the surface to be scanned are made incident such that principal rays thereof form an angle (angle α) with respect to a normal line of the surface to be scanned, respectively (Fig. 7) (col. 6, lines 39-47), whereby when it is assumed that a maximum value of a positional deviation amount, which is generated in a first direction relatively parallel to the main-scanning direction between focusing points of the respective light beams on the surface to be scanned, is $\delta Y1$ (col. 7, lines 41-51), a maximum value of a positional deviation amount, which is generated in a second direction relatively parallel to the main-scanning direction between the focusing points of the respective light beams on the surface to be scanned as convergent light beams or divergent light beams are made incident on the third optical system in the main scanning direction, is $\delta Y2$ (col. 7, lines 54-67).

Ishibe teaches the required conditions that bind the two maximum values of the positional deviation amounts $\delta Y1$ and $\delta Y2$ with respect to the distance P between two adjacent scanning lines, for a printer having a resolution of 600 dpi, such that:

$$|\delta Y1 + \delta Y2| < P/3 = 0.01411 \text{ mm} \quad (\text{equations 6 and 8})$$

where $\delta Y1 = +0.00212 \text{ mm}$

$\delta Y2 = -0.00229 \text{ mm}$.

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but fails to include the third positional deviation amount δY_3 in the main scanning direction due to the relative wavelength difference between the light emitting sections.

Kato discloses that the imaging position deviation caused by a wavelength variation between the multiple laser light sources has to be suppressed to an amount of 50 μm or less in a printer having a resolution of 600 dpi (paragraphs [0059]-[0060]) or

$$\delta Y_3 = 50 \mu\text{m} = 0.050 \text{ mm},$$

the largest positional deviation as compared to δY_1 and δY_2 . In other words, the combined positional deviation amounts would give:

$$|\delta Y_1 + \delta Y_2 + \delta Y_3| \leq \text{MAX} (|\delta Y_1|, |\delta Y_2|, |\delta Y_3|)$$

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to set the different positional deviation amounts in the device of Ishibe to also account for the positional deviation amount caused by a wavelength variation as taught by Kato. The motivation for doing so would have been to reduce the positional deviations of the different laser beams and thus to reduce the misregistration between colors.

Ishibe further teaches:

- The positional deviations δY_1 and δY_2 having opposite signs, and either one can be negative or positive (col. 10, lines 57-59), and thus the following relationship $\delta Y_1 \times (\delta Y_2 + \delta Y_3) < 0$ is met when δY_1 has a negative sign,
- both the second direction and the third direction are directions opposite to the first direction (by virtue of the teaching at col. 10, lines 57-59),

- a second optical system (cylinder lens 4) which focuses the plural light beams, which have passed through the first optical system, on the reflection surfaces of the rotating polygon mirror in a linear shape extending in the main-scanning direction (col. 5, lines 37-45),
- a photosensitive member (photosensitive drum 101) (Fig. 15) arranged on the surface to be scanned, a developing device (107) which develops an electrostatic latent image, which is formed on the photosensitive member by a light beam used for scanning in the multi-beam optical scanning device, as a toner image, a transfer device (transfer roller 108) which transfers the developed toner image onto a material to have an image transferred thereon, and a fixing device (fixing roller 113) which fixes the transferred toner image to the material to have an image transferred thereon.

4. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishibe in view of Kato, as applied to claims 1, 3, 5-6 above, and further in view of Kimura (U.S. 7,015,940).

Ishibe, as modified by Kato, discloses all the basic limitations of the claimed invention except for the printer controller which converts code data inputted from an external device into an image signal and inputs the image signal to the multi-beam optical scanning device, the plural image bearing members which are arranged on the surfaces to be scanned of the multi-beam optical scanning devices and the formation of different color images.

Kimura discloses a scanning optical apparatus for forming color images, the apparatus including plural image bearing members, which are arranged on the surfaces to be scanned of the multi-beam optical scanning devices, to form different color images (Fig. 7), and the printer controller (111, Fig. 9), which converts code data inputted from an external device (117) into an image signal (col. 4, lines 54-59).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the multi-beam optical scanning devices to form different color images as well as the code converter to the device of Ishibe as taught by Kimura since Kimura teaches this to be well known in the art that the plural multi-beam optical scanning devices are needed to form color images and that the printer controller is needed to format the input image data such that the image can be properly formed.

Allowable Subject Matter

5. Claim 4 is allowed.
6. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
7. The following is an examiner's statement of reasons for allowance: claim 4 is patentable over the prior art patents and printed publications because of the specific required relationship, which involves different parameters of the optical scanning apparatus, the parameters including the number of the plural luminescence parts, the

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average value of an angle formed by the principal rays of the plural light beams emitted from the first optical system and the optical axis of the third optical system, the focal length of the first optical system, the interval of the plural luminescence parts, the average value of the angle which the principal rays of the plural light beams to be made incident on the surface to be scanned in the sub-scanning section forms with respect to the normal line of the surface to be scanned, the radius of a circle inscribed in the rotating polygon mirror, the maximum scanning angle of the plural light beams deflected and used for scanning by the rotating polygon mirror, the angle formed by the normal line of the surface to be scanned in the maximum scanning position of the plural light beams, which are used for scanning the surface to be scanned by the third optical system, and the plural light beams, the maximum value of the relative wavelength difference of the plural light beams emitted from the plural luminescence parts, the distance from a light outgoing side principal plane of the third optical system to a natural convergent point of the convergent light beams or the divergent light beams converted by the first optical system, the distance from the light outgoing side principal plane of the third optical system to a position, in which the convergent light beams or the divergent light beams converted by the first optical system are converged and focused by the third optical system, the $f\theta$ coefficient of the third optical system, and the interval of focusing points in the sub-scanning direction on the surface to be scanned of the plural light beams determined from a resolution. This serves to even reduce color misregistration and is not taught by the prior art of record alone or in combination.

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8. The following is a statement of reasons for the indication of allowable subject matter: the primary reason for the indication of the allowability of claim 2 is the inclusion therein, in combination as currently claimed, of the limitation related to the specific relationship between the different positional deviation amounts, which is not found taught by the prior art of record considered alone or in combination

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HAI PHAM
PRIMARY EXAMINER

May 13, 2006